The Sutton Academy

Knowledge Rich Curriculum Plan

Year 9 Support – Probability

Lesson objective	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Steps to Success	Feedback
To learn how to determine the probability of an event.	• Students will know how to write probabilities in words or fractions, decimals and percentages; E.g. unlikely can be represented as 25%, 0.25 and ¼. • Students will know how to find the probability of an event. • Students will know how to find probabilities using the 'OR' rule by adding simple probabilities. • Students will know that to calculate the probability of an event not occurring you need to subtract the given probabilities from 1. • Students will know that all probabilities add to give 1 or 100%.	**Probability** - the extent to which an event is likely to occur, often expressed as a fraction or decimal.	• Students need to know how to represent probability on a probability scale. • Students will need to know how to distinguish between events which are impossible, unlikely, even chance, likely, and certain to occur. Students will know that impossible is represented by 0, even chance by 0.5 and certain by 1. IF STUDENTS GET THIS WRONG PRIOR CONSOLIDATION TASK NEEDS TO BE COMPLETED.	**Steps to Success – Probability of an event** Step 1: Identify the number of times the particular event can happen. Step 2: Identify the total number of possible outcomes. Step 3: Use the formula below to calculate the probability of the event happening. Probability of an event happening = $\frac{Number\ of\ ways\ it\ can\ happen}{total\ number\ of\ outcomes}$ *N.B DO NOT simplify any fractions!*	
To learn how to complete probability tables.	• Students will know how to calculate a missing probability from a list or table. • Students will know how to calculate a missing probability from a list or table where algebra is used or the probability of one event is two/three times the probability of another.		• Students need to know how to add decimals. • Students need to know how to subtract a decimal from 1.	**Steps to Success – Probability tables** If you consider **all possible outcomes** of an event (known as exhausting all options) then the probabilities must add up to 1. To calculate the missing probability, calculate the total of the given probabilities and subtract from 1. It is important to read the question as sometimes it may tell you something extra.	
To learn how to estimate the amounts of times an event will happen.	• Students will know how to use relative frequency to estimate the number of times an event will occur, for both experimental and theoretical probabilities. • Students will know how to use the 'OR' rule to determine the probability of one or more outcomes and will know how to use this to find an estimate for the number of times an event occurs.		• Students need to know how to find the probability of an event.	**Steps to Success – Expected Frequency** We can use relative frequency to calculate expected frequency, which is the number of times we expect an outcome to happen. It is calculated as follows: Expected frequency = probability × number of trials	
To learn how to list all the outcomes for events and use sample space diagrams.	• Students will know how to list all of the outcomes for events systematically to find probabilities. • Students will know how to construct and use sample space diagrams to find probabilities.	**Systematically –** according to a fixed plan or system; methodically. **Sample Space Diagram -** A sample space diagram is used to display all possible outcomes	• Students need to know how to find the probability of an event.	**Steps to Success – Listing Outcomes** **Step one:** Record all the outcomes for one of the objects. In the example of a single dice this would be 1,2,3,4,5 and 6. **Step two:** With each outcome for the first object, record one of the outcomes for the second object. If the second item was a coin then the example outcomes could now say 1H, 2H, 3H, 4H, 5H and 6H. **Step three:** Repeat the list of outcomes for all the **alternative** outcomes from the second object. **Steps to Success - Completing a Sample Space Table** **Step 1: Identify the Two Events** - Decide what two things are happening in the experiment. Example: Rolling two dice. Die 1 outcomes: 1, 2, 3, 4, 5, 6 Die 2 outcomes: 1, 2, 3, 4, 5, 6	

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				Step 2: Set Up the Table- Create a table with one event's outcomes as the column headers (top row). Use the other event's outcomes as the row labels (left column). Leave the top-left cell blank. **Step 3: Fill in the Table with Combined Outcomes** In each cell, write the outcome as an ordered pair: (row, column). Example: (1,1), (1,2), ..., (6,6) Make sure the order of the pair is consistent (e.g. Die 1 result first, then Die 2). **Step 4: Check That the Table is Complete** Count the total number of outcomes. Use the formula: Total outcomes = number of rows × number of columns Example: 6 × 6 = 36 outcomes for two dice **Step 5: Use the Table to Answer Probability Questions** Highlight or count the favourable outcomes based on the question. Use the probability formula: Probability = (Number of favourable outcomes) ÷ (Total number of outcomes)	
To learn how to draw, complete and use two-way tables.	• Students will know how to complete a two-way table with given information. • Students will know how to design and complete a two-way table from information. • Students will know how to calculate probabilities from a two-way table.	**Two-Way Table –** A way to show information about **two different categories** at the same time. Reading available	• Students need to know how to add and subtract using the column method. • Students need to know how to find the probability of an event.	**Steps to Success – Two-way Tables** **Step 1** – Fill in any information that you know, some information may already be completed for you. **Step 2** – Complete calculations (addition/subtraction) to find the missing values. **Step 3** – The question may ask you to calculate the probability relating to the variables in the question	
To learn how to complete and use a frequency tree to find probabilities.	• Students will know how to complete a partially completed frequency tree and use it to find a frequency and/or calculate probabilities. • Students will know how to complete a frequency tree from given information and use it to find a frequency and calculate probabilities. **Opportunity for challenge:** • Students will know to complete frequency trees for more complex problems.	**Frequency Tree –** a diagram used to show how a group of people/things can be broken up into certain categories Reading available	• Students need to know how to add and subtract using the column method. • Students need to know how to find the probability of an event.	**Steps to Success – Frequency Trees** **Step 1** – Read the information you have been given and put it into the appropriate part of the diagram **Step 2** – Using the information in the table and/or any information in the question complete an appropriate calculation (addition or subtraction) to find the missing values. **Step 3** – Check if the question is asking for anything else, such as a probability.	
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